CLAIMS

We claim:

1.   A computer-implemented method of creating a virtual traffic network comprising:

        (a) inputting map data representing a road system;

        (b) inputting flow data related to traffic flow on the road system; and

        (c) integrating the map data and the flow data to produce a virtual traffic network representing traffic conditions on the road system.

2.   The method of claim 1 wherein the flow data is real-time flow data, the virtual traffic network representing real-time traffic conditions on the road system.

3.   The method of claim 1 wherein the flow data is input from a plurality of road sensors.

4.   The method of claim 1 wherein step (a) further comprises customizing the map data to define locally known features of the road system.

5.   The method of claim 1 wherein the map data and the flow data have a synaptic relationship with each other.

6.   The method of claim 1 wherein the virtual traffic network is spatially oriented.

7.   A computer-implemented method of creating a virtual traffic network comprising:

        (a) inputting map data representing a road system;

        (b) inputting traffic information about traffic events on the road system; and

        (c) integrating the map data and the traffic information to produce a virtual traffic network representing traffic conditions on the road system.

8.   The method of claim 7 wherein the traffic information includes information related to one or more incidents on the road system.

9.   The method of claim 7 wherein the traffic information includes congestion information.

10.   The method of claim 7 wherein the traffic information includes location information.

11.   The method of claim 7 wherein the traffic information is input by a traffic operator.

12.   The method of claim 7 wherein the traffic information is input using one or more electronic traffic forms, each traffic form including at least one predefined traffic parameter field.

13.   The method of claim 7 wherein step (a) further comprises customizing the map data to define locally known features of the road system.

14.   The method of claim 7 wherein the map data and the traffic information have a synaptic relationship with each other.

15.   The method of claim 7 wherein the virtual traffic network is spatially oriented.

16.   A computer-implemented method of creating a virtual traffic network comprising:
        (a) inputting map data representing a road system;
        (b) inputting flow data related to traffic flow on the road system;
        (c) inputting traffic information about traffic events on the road system; and
        (d) integrating the map data, the flow data and the traffic information to produce a
virtual traffic network representing traffic conditions on the road system.

17.   The method of claim 16 wherein the flow data is real-time flow data, the virtual traffic network representing real-time traffic conditions on the road system.

18.   The method of claim 16 wherein the flow data is input from a plurality of road sensors.

19.   The method of claim 16 wherein step (a) further comprises customizing the map data to define locally known features of the road system.

20.   The method of claim 16 wherein the traffic information includes information related to one or more incidents on the road system.

21.   The method of claim 16 wherein the map data, the flow data and the traffic information have a synaptic relationship with each other.

22.   The method of claim 16 wherein the virtual traffic network is spatially oriented.

23.   A computer-implemented method of entering traffic information for a road system, the method comprising:

           (a) providing one or more electronic traffic forms, each traffic form including at least one predefined traffic parameter field;

           (b) entering traffic information about traffic events on the road system into one of the traffic forms, the traffic information corresponding to the at least one traffic parameter field on the selected form;

           (c) providing a virtual traffic network representing traffic conditions on the road system; and

           (d) integrating the traffic information entered into the selected traffic form into the virtual traffic network.

24.   The method of claim 23 wherein step (a) further comprises providing an electronic traffic form for an incident on the road system.

25.   The method of claim 23 wherein step (b) further comprises entering traffic information related to congestion on the road system.

26.   The method of claim 23 wherein the selected traffic parameter field is selected from a pull-down menu.

27.   The method of claim 23 wherein the at least one traffic parameter field includes location information.

28.   The method of claim 23 wherein the at least one traffic parameter field includes an end location corresponding to the entered traffic information, such that the entered traffic information defines a span of a traffic event within the virtual traffic network.

29.   The method of claim 23 wherein the at least one traffic parameter field corresponds to the road system of the virtual traffic network.

30.   The method of claim 23 further comprising:

        (e) creating a traffic item, the traffic item including traffic data from the virtual traffic network reflecting the traffic information integrated in step (d).

31.   The method of claim 23 wherein the at least one traffic parameter field links the entered traffic information to corresponding traffic information previously integrated into the virtual traffic network.

32.   The method of claim 23 wherein the traffic information is entered by a traffic operator.

33.   The method of claim 23 wherein the traffic information integrated in step (d) has a synaptic relationship with map data and flow data in the virtual traffic network.

34.   A computer-implemented method of querying a system that provides traffic data for a road system, the method comprising:

        (a) providing a virtual traffic network representing traffic conditions on the road system;

        (b) providing one or more electronic traffic forms, each form including at least one predefined traffic parameter field;

        (c) entering a traffic query into one of the forms, the query defined by the at least one traffic parameter field on the selected form; and

        (d) obtaining the traffic data corresponding to the query from the virtual traffic network.

35. The method of claim 34 further comprising:

(e) reporting the traffic data obtained in step (d) to an end user.

36. The method of claim 35 wherein step (a) further comprises updating the traffic data in the virtual traffic network in real-time, the virtual traffic network representing real-time conditions on the road system, wherein step (e) further comprises continuously and automatically updating the reported traffic data based on the real-time conditions of the virtual traffic network.

37. The method of claim 36 wherein the traffic data is updated based on real-time flow data collected from roadside sensors.

38. The method of claim 34 wherein step (a) further comprises updating the traffic data in the virtual traffic network in real-time, the virtual traffic network representing real-time conditions on the road system.

39. The method of claim 34 wherein step (d) further comprises sorting the traffic data according to one or more predefined rendition rule sets.

40. The method of claim 34 wherein the traffic data obtained in step (d) includes travel time.

41. The method of claim 34 wherein the traffic data obtained in step (d) includes delay time.

42. The method of claim 34 wherein the traffic data obtained in step (d) includes congestion information.

43. The method of claim 34 wherein the traffic data obtained in step (d) includes speed.

44. A computer-implemented method of rendering traffic data representing traffic conditions on a road system, the method comprising:

(a) defining one or more renditions of the traffic data, each rendition comprising a predefined rendition rule set;

(b) inputting a traffic item; and

(c) creating a rendition of traffic data corresponding to the traffic item for each defined rendition.

45.   The method of claim 44 wherein the traffic item is created from traffic information which is integrated into the virtual traffic network.

46.   The method of claim 44 further comprising:

(d) updating the traffic data stored in each rendition in real-time.

47.   The method of claim 44 wherein step (c) further comprises storing one or more parameters of the traffic data in one or more of the renditions as a variable.

48.   The method of claim 44 wherein the traffic data corresponds to a virtual traffic network.

49.   The method of claim 44 wherein step (a) further comprises defining a plurality of renditions of the traffic data.

50.   A computer-implemented method of rendering traffic data representing traffic conditions on a road system, the method comprising:

(a) selecting a group of traffic items, each traffic item represented by one or more renditions;

(b) selecting one of the renditions, each rendition having a predefined rendition rule set; and

(c) obtaining the traffic data for the group of traffic items within the selected rendition and organizing the traffic data according to the rendition rule set in the selected rendition.

51.   The method of claim 50 further comprising:

(d) displaying the organized traffic data obtained in step (c) as a single text string.

52.   The method of claim 50 wherein the group of traffic items represents traffic data for a single direction on a road in the road system.

53.   The method of claim 50 wherein the group of traffic items represents traffic data for two different directions on a road in the road system.

54.   The method of claim 50 further comprising:

            (d) generating a traffic report reflecting the traffic conditions on the road system based on the organized traffic data obtained in step (c).

55.   The method of claim 50 wherein each rendition rule set is formatted for use with one or more applications.

56.   The method of claim 50 wherein the traffic data obtained in step (c) represents real-time traffic conditions on the road system.

57.   The method of claim 50 wherein the traffic data corresponds to a virtual traffic network.

58.   A computer-implemented method of displaying traffic data corresponding to a virtual traffic network representing traffic conditions on a road system, the method comprising:

            (a) creating a graphical map of the road system, the graphical map including a plurality of links;

            (b) determining a status of one or more of the links on the graphical map, the status corresponding to the traffic data associated with each respective link; and

            (c) creating an animated traffic flow display of the road system by combining the graphical map and the status for each link.

59.   The method of claim 58 further comprising:

            (d) updating the traffic data by inputting flow data to the virtual traffic network, the traffic flow display reflecting the updated traffic data.

60. The method of claim 59 wherein the traffic data is updated by inputting traffic information and flow data to the virtual traffic network.

61. The method of claim 59 wherein the traffic flow display is updated in real-time.

62. The method of claim 58 wherein the status of the links represent traffic data which includes congestion information.

63. The method of claim 58 wherein each of the links on the traffic flow display are color coded to reflect their respective status.

64. The method of claim 58 wherein each link on the traffic flow display is animated to reflect their respective status, by simulating different vehicle speeds that are relative to actual vehicle speeds.

65. The method of claim 58 wherein one or more icons corresponding to one or more traffic events for one of the links are placed on the animated flow display.

66. The method of claim 58 wherein the animated flow display is rendered in video format.

67. The method of claim 58 wherein the animated flow display is rendered in broadcast television format.

68. The method of claim 58 wherein the animated flow display is rendered in satellite broadcast format.

69. The method of claim 58 wherein the animated flow display is rendered in cable television format.

70. An animated traffic flow display representing traffic conditions on a road system comprising:

(a) a graphical map of the road system, the graphical map including a plurality of links of the road system; and

(b) animated traffic flow on the graphical map associated with each link, the animated traffic flow corresponding to traffic data from a virtual traffic network associated with that link.

71.   The traffic flow display of claim 70 wherein the traffic data is updated by inputting traffic information and flow data to the virtual traffic network.

72.   The traffic flow display of claim 70 wherein the animated traffic flow is updated in real-time.

73.   The traffic flow display of claim 70 wherein each link on the graphical map represents traffic data which includes congestion information.

74.   The traffic flow display of claim 70 wherein each link on the graphical map is color coded to reflect the traffic conditions of that link.

75.   The traffic flow display of claim 70 wherein each link on the graphical map is animated to reflect the traffic conditions of that link by simulating different vehicle speeds that are relative to actual vehicle speeds.

76.   The traffic flow display of claim 70 wherein one or more icons corresponding to one or more traffic events for one of the links are placed on the graphical map.

77.   The traffic flow display of claim 70 wherein the graphical map is rendered in video format.

78.   The traffic flow display of claim 70 wherein the graphical map is rendered in broadcast television format.

79.   The traffic flow display of claim 70 wherein the graphical map is rendered in satellite broadcast format.

80.   The traffic flow display of claim 70 wherein the graphical map is rendered in cable television format.